# SAS to SAS/SATA JBOD Subsystem

# User Manual

**Revision 1.0**

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# Chapter 1 Introduction

**The 24 bays JBOD Subsystem**

This JBOD subsystem is a 19-inch 2U rackmount JBOD unit with optimized solutions for servers and external storage systems. It features the latest SAS 3.0 12Gb/s interface and designed to fit in with the environments which needed highly reliable and relentless data growth. This JBOD subsystem incorporates the latest enhancements in SAS along with LSI DataBolt bandwidth optimizer technology (EDFB, End Device Frame Buffering). Using DataBolt, it delivers optimized throughput by allowing users to gain 12Gb/s host speeds with current-generation 6Gb/s drives. It is also a versatile SAS3 / SATA3 disk expansion system, ideal for high capacity and scalability storage in IT demands. The JBOD subsystem also supports dual JBOD controllers which provide better fault tolerance and higher reliability of system operation. It offers GUI management to monitor enclosure environmental conditions through a remote connection.

## 1.1 Features

**High Density Available**

- 24 hot-swappable drive bays in a rackmount 2U chassis
- Support the latest 2.5”enterprise class SAS3/SATA3 HDD or SSD drives

**High Availability**

- Single / Dual SAS JBOD controller module
- Each SAS JBOD controller module consist of three 4x mini SAS HD ports
- Utilizes LSI DataBolt bandwidth optimizer technology

**Power supply**

- Power Supply and cooling system contained in 1 module for efficient cooling
- Two 300W redundant hot swappable power supplies

**Enclosure**

- Incorporates a cableless design for maximum signal integrity
- Utilizes industry-standard SCSI enclosure services(SES) to monitor enclosure and disk environmental conditions

**Enclosure Monitoring**

- S.E.S. support for standard enclosure management
- System LED indications
- Fan speed monitoring
- Power supply monitoring
- System voltage monitoring
- System temperature monitoring
- System alarm
- Remote GUI management

## 1.2 Technical Specifications

| | |
|---|---|
| **JBOD Controller** | Single / Redundant |
| **Host Interface** | One 4x mini SAS HD (12Gb/s) / Two 4x mini SAS HD (12Gb/s) |
| **Disk Interface** | 12Gb/s SAS, 6Gb/s SATA |
| **SAS expansion** | Two 4x mini SAS HD (12Gb/s) / Four 4x mini SAS HD (12Gb/s) |
| **Enclosure** | |
| **Platform** | Rackmount |
| **Form Factor** | 2U |
| **# of Hot Swap Trays** | Twenty four (24) 2.5" Small Form Factor(SFF) trays |
| **Disk Status Indicator** | Access / Fail LED |
| **Backplane** | SAS / SATA Single BP |
| **# of PS/Fan Modules** | 300W x 2 w/PFC |
| **# of Fans** | 2 |
| **Power requirements** | AC 90V ~ 264V Full Range, 8A ~ 4A, 47Hz ~ 63Hz |
| **Environmental** | |
| **Relative Humidity** | 10% ~ 85% Non-condensing |
| **Operating Temperature** | 10°C ~ 40°C (50°F ~ 104°F) |
| **Physical Dimension** | 559(L) x 483 (W) x 88(H) mm |
| **Weight (Without Disk)** | 14 / 15 Kgs |

Specifications are subject to change without notice.

## 1.3 Unpacking the JBOD Subsystem

The shipping package contains the following:

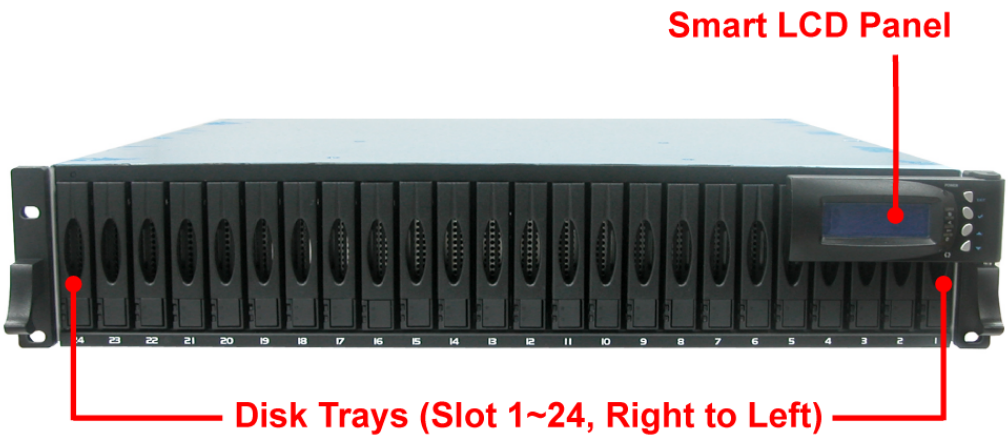
| | |
|---|---|
| | JBOD Subsystem Unit |
| | Two (2) power cords |
| | One (1) serial cable for single JBOD controller<br>Two (2) serial cables for dual JBOD controllers |
| | One (1) mini SAS HD cable for single JBOD controller<br>Two (2) mini SAS HD cables for dual JBOD controllers |
| | One (1) Ethernet LAN cable for single JBOD controller<br>Two (2) Ethernet LAN cables for dual JBOD controllers |
| | One(1) JBOD Controller Blanking Plate<br>Note: For dual JBOD controllers |
| | One(1) PSFM Plate Cover |
| | User Manual |

**NOTE: If any damage is found, contact the dealer or vendor for assistance.**

## 1.4 Identifying Parts of the JBOD Subsystem

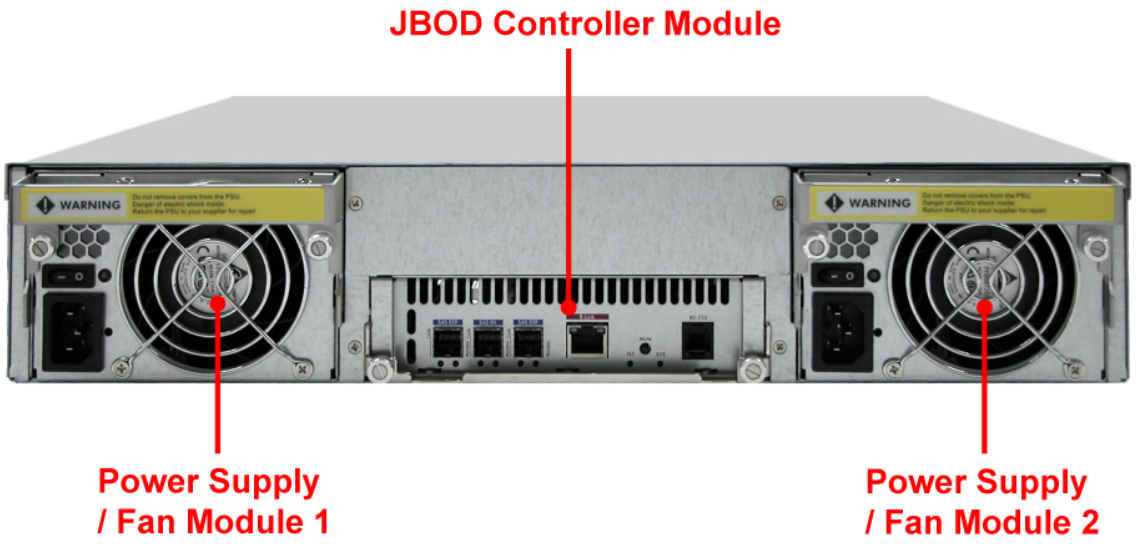
The illustrations below identify the various parts of the expansion chassis.

### 1.4.1 Front View

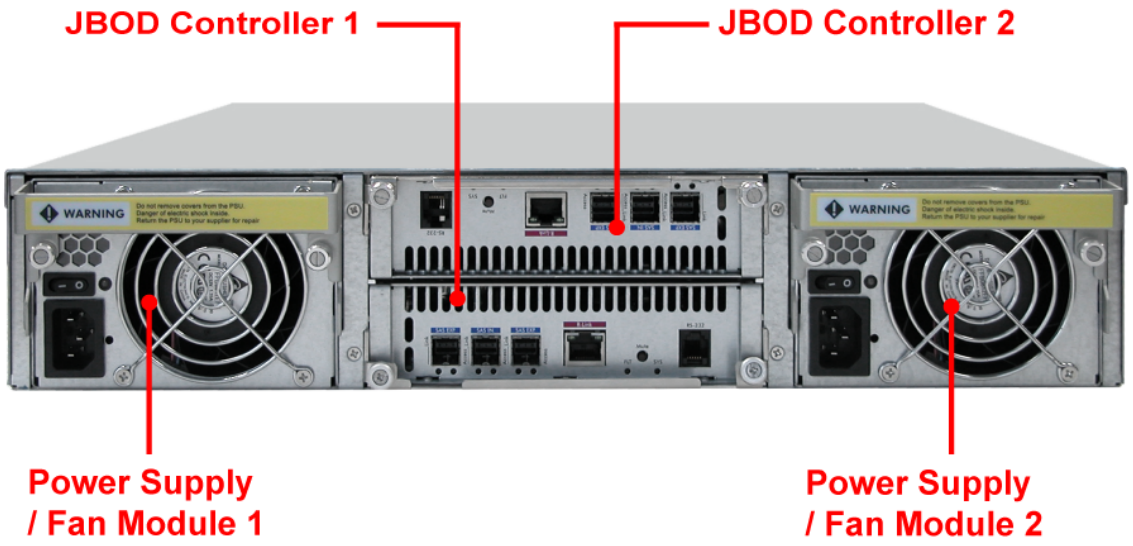



### 1.4.2 Rear View

**Single Controller**

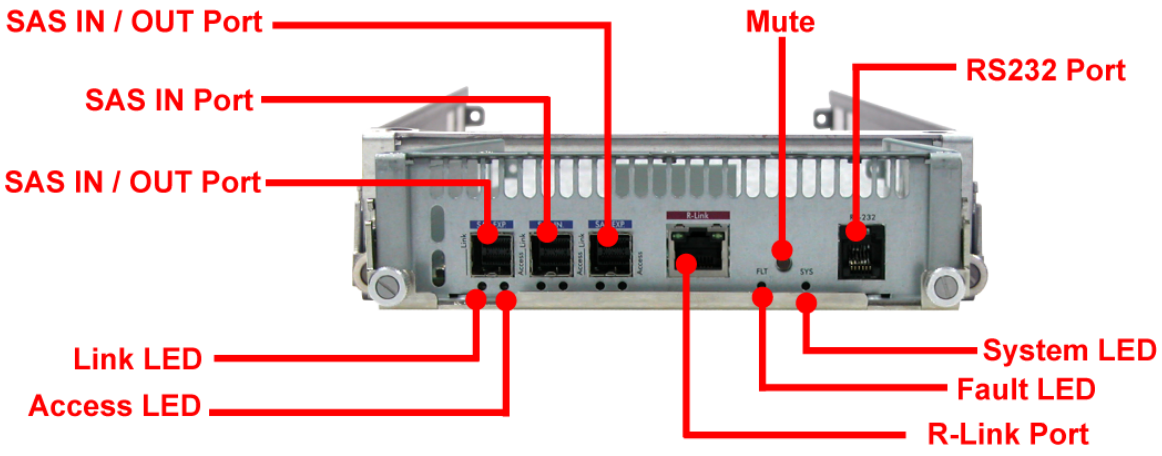


**Dual Controller**




### 1.4.3 JBOD Controller Module

#### 1.4.3.1 JBOD Controller Panel




**NOTE: SAS IN/OUT Port can be flexibly configured as either SAS IN PORT or SAS OUT PORT by customer's request**

**SAS IN Port**: SAS cable must be connected to this port and to the SAS HBA, or other Expansion Chassis's SAS Expansion Port, if this chassis is connected in daisy-chain.

**SAS OUT Port**: SAS cable must be connected to these ports and to other SAS IN Port of other expansion chassis for daisy-chaining.

**Link LED (SAS IN and SAS OUT)**: Green indicates SAS IN/OUT Port has connected or linked.

**Access LED (SAS IN and SAS OUT)**: Blue indicates SAS IN/OUT Port is being accessed.

**RS-232 Port**: Used for upgrading the Firmware of JBOD controller in the Expansion Chassis.

**Mute**: Use this button to silence the alarm beeper. If another failure event happens, the alarm beeper will sound again and this button can be pressed again to silence alarm.

**System LED**: Green indicates Expansion Chassis is Powered On and Ready.

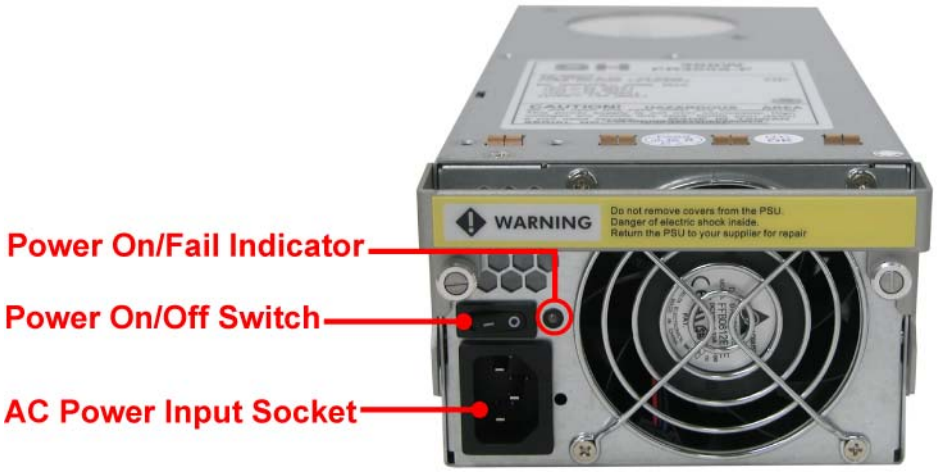
**Fault LED**: Red (LED is on) indicates there is problem within the Expansion Chassis. If LED is off, the Expansion Chassis is in normal condition.

**R-Link Port**: Use to connect to Telnet for upgrading the Firmware of JBOD controller

## 1.5 Power Supply Fan Module (PSFM)

The JBOD subsystem contains **two 300W Power Supply / Fan Modules**. All PSFMs are inserted into the rear of the chassis.

### 1.5.1 PSFM Panel


Power On/Fail Indicator
Power On/Off Switch
AC Power Input Socket
WARNING
Do not remove covers from the PSU.
Danger of electric shock inside.
Return the PSU to your supplier for repair

The panel of the Power Supply/Fan Module contains: the Power On/Off Switch, the AC Inlet Plug, and a Power On/Fail Indicator showing the Power Status LED, indicating ready or fail.

Each fan within a PSFM is powered independently of the power supply within the same PSFM. So if the power supply of a PSFM fails, the fan associated with that PSFM will continue to operate and cool the enclosure.

When the power cord connected from main power source is inserted to the AC Power Inlet, the power status LED becomes RED. When the switch of the PSFM is turned on, the LED will turn GREEN. When the Power On/Fail LED is GREEN, the PSFM is functioning normally.

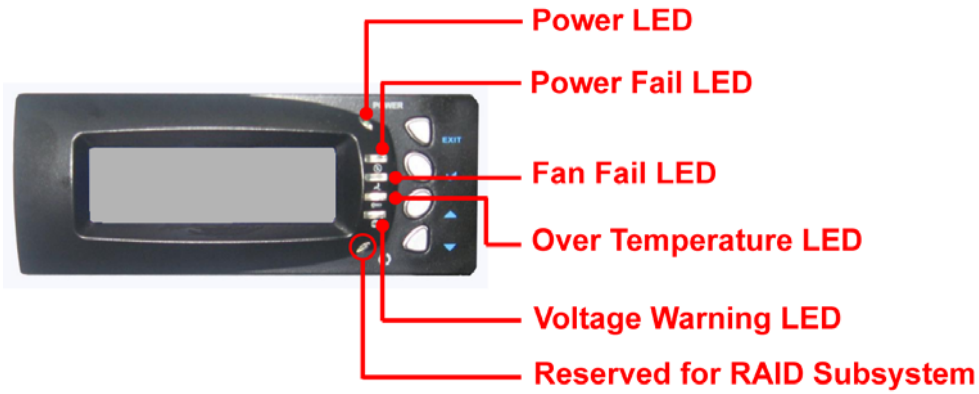
**NOTE: Each PSFM has one Power Supply and one Fan. PSFM 1 has Power#1 and Fan#1, and PSFM 2 has Power#2 and Fan#2. When the Power Supply of a PSFM fails, the PSFM need not be removed from the slot if replacement is not yet available. The fan will still work and provide necessary airflow inside the enclosure.**

**In replacing the failed PSFM, refer to section 3.2.2 of this manual.**

**NOTE: After replacing the Power Supply Fan Module and turning on the Power On/Off Switch of the PSFM, the Power Supply will not power on immediately. The Fans in the PSFM will spin-up until the RPM becomes stable. When Fan RPM is already stable, the RAID controller will then power on the Power Supply. This process takes more or less 30 seconds. This safety measure helps prevent possible Power Supply overheating when the Fans cannot work.**

## 1.6 LCD Display Panel

### 1.6.1 LCD Panel LED

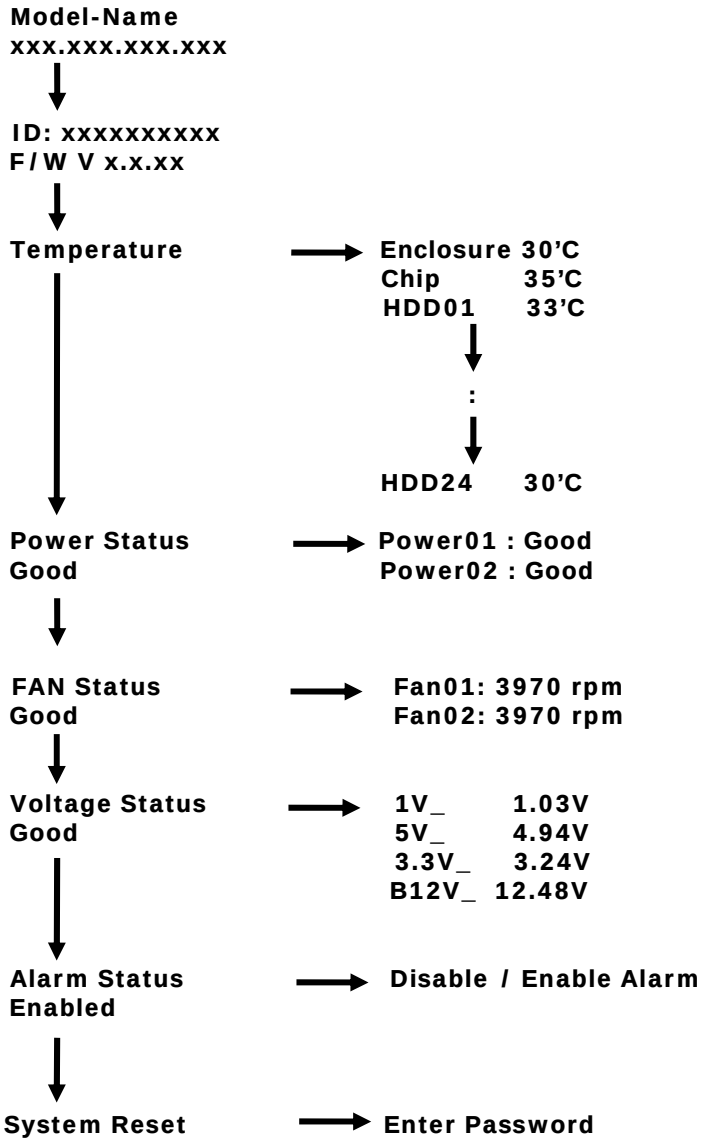



| Parts | Function |
|---|---|
| Power LED | Green indicates power is ON. |
| Power Fail LED | If one of the redundant power supply unit fails, this LED will turn to RED and alarm will sound. |
| Fan Fail LED | Turn RED when fan 1 or 2 fails, or speed is lower than 3000 RPM |
| Over Temperature LED | If system temperature is over 70°C or disk temperatures exceed 55°C, the Over Temperature LED will turn RED and alarm will sound. |
| Voltage Warning LED | An alarm will sound if detected voltage in the controller is abnormal and LED will turn RED. |

### 1.6.2 LCD Panel Function Buttons

| Parts | Function |
|---|---|
| Up and Down Arrow buttons ▲ ▼ | Use the Up or Down arrow keys to go through the information on the LCD screen. This is also used to move between each menu. |
| Select button ✔ | This is used to enter the option you have selected. |
| Exit button EXIT | Press this button to return to the previous menu.<br>NOTE: This button can also be used to silence the alarm beeper when in main menu. If you are in submenu and a failure event happens, press the EXIT button few times as necessary to go back to main menu, and press again to silence the alarm. |

### 1.6.3 Menu Diagram



## 1.7 Drive Carrier Module

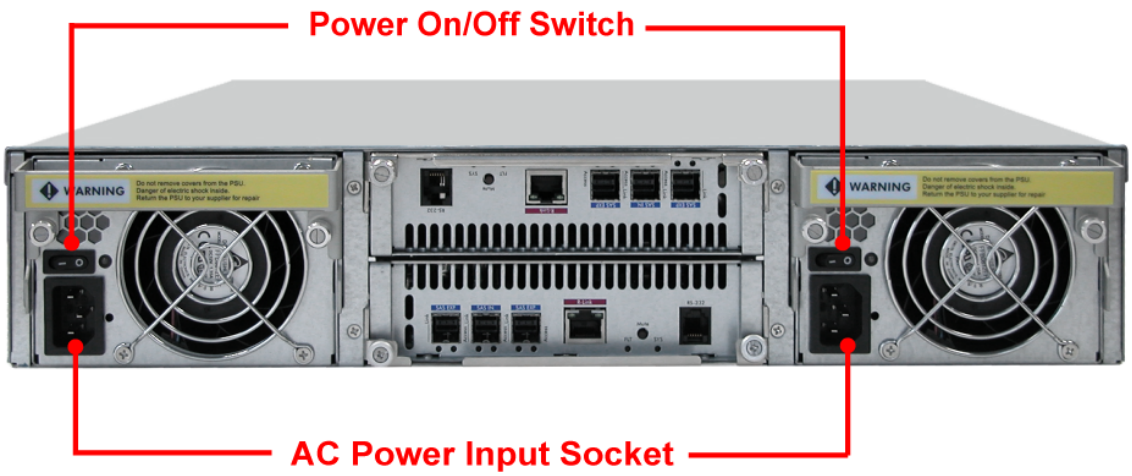
### 1.7.1 Disk Drive Status Indicators

| Part | Function |
|---|---|
| Disk Activity Indicator | This LED will blink blue when the hard drive is being accessed. |
| Disk Status Indicator | Green LED indicates power is on and hard drive status is good for this slot. If there is no hard drive, the LED is off. The fault indicator depends on the RAID card or RAID Controller definition. |

# Chapter 2 Installation of JBOD Subsystem

## 2.1 Powering On

1. Plug in the power cords into the AC Power Input Socket located at the rear of the subsystem.




**NOTE: The subsystem is equipped with redundant, full range power supplies with PFC (power factor correction). The system will automatically select voltage.**

2. Turn on each Power On/Off Switch to power on the subsystem.
3. The Power LED on the front panel will turn green.

## 2.2 Disk Drive Installation

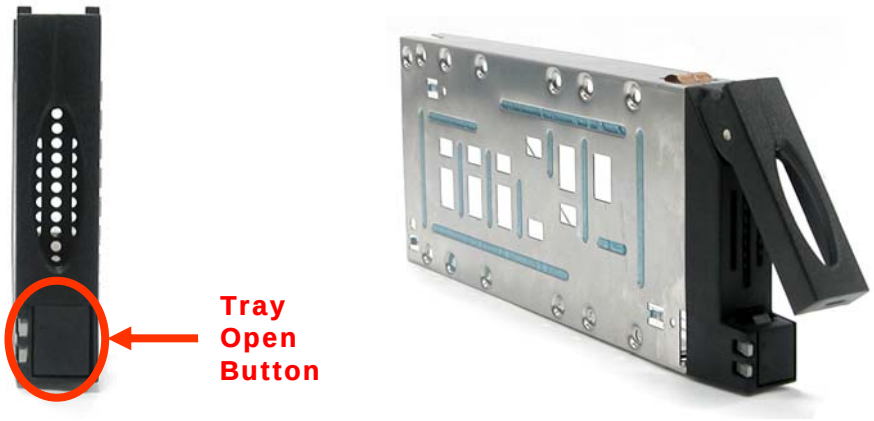
This section describes the physical locations of the hard drives supported by the subsystem and give instructions on installing a hard drive. The subsystem supports hot-swapping allowing you to install or replace a hard drive while the subsystem is running.

**NOTE: In this model, it is recommended to use 6Gb/s hard drive disks.**

### 2.2.1 Installing a SAS Disk Drive in a Disk Tray

**NOTE: These steps are the same when installing SATA disk drive in Single Controller Mode.**

1. Press the Tray Open button and the Disk Tray handle will flip open.




2. Pull out an empty disk tray. Pull the handle outwards to remove the tray from the enclosure.

3. Place the hard drive in the disk tray. Make sure the holes of the disk tray align with the holes of the hard drive.

4. Install the mounting screws on the bottom part to secure the drive in the disk tray.

5. Slide the tray into a slot.

6. Press the lever in until you hear the latch click into place. The HDD Fault LED will turn green when the subsystem is powered on and HDD is good.

### 2.2.2 Installing a SATA Disk Drive (Dual JBOD Controller Mode) in a Disk Tray

1. Remove an empty disk tray from the subsystem.

2. Prepare the dongle board and two screws.

3. Place the dongle board in the disk tray. Turn the tray upside down. Tighten a screw to secure the dongle board into the disk tray.

4. Place the SATA disk drive into the disk tray. Slide the disk drive towards the dongle board.

5. Turn the disk tray upside down. To secure the disk drive into the disk tray, tighten four screws on the holes of the disk tray. Note in the picture below where the screws should be placed in the disk tray holes.

6. Insert the disk tray into the subsystem.

## 2.3 Connecting the JBOD Subsystem

### 2.3.1 Connecting to SAS HBA

The Enclosure supports SAS interface which provides fast 1,200MB data transfer rate using SAS phy. Attach one end of the SAS cable to the SAS IN Port and the other end to the host bus adapter's (HBA) external SAS connector or to the SAS Switch. (The host bus adapter is installed in your Host computer system.)

### 2.3.2 Connecting to RAID Subsystem

Attach one end of the SAS cable to the SAS IN Port of the JBOD controller module and the other end to the SAS Expansion Port on the RAID controller of RAID subsystem. If configured in redundant mode, connect the other SAS cable to the SAS IN Port of the other JBOD controller, and the other end to the SAS Expansion Port on the other RAID controller of RAID subsystem.

# Chapter 3 Maintenance

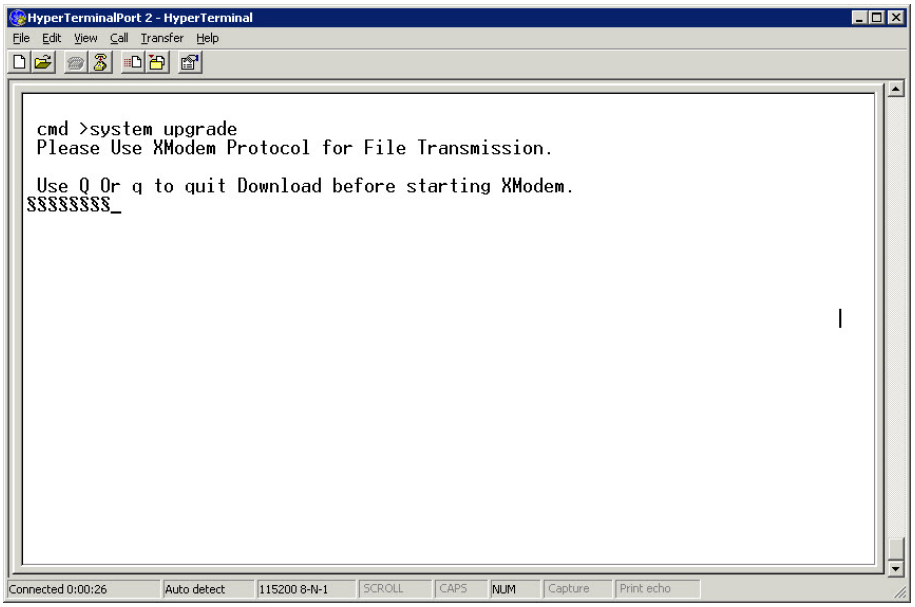
## 3.1 Upgrading Firmware

**IMPORTANT: Before upgrade the JBOD firmware, please shut down server first or make sure no array setting on the JBOD disks. The new Firmware will effective after JBOD power cycle.**

**NOTE: Upgrading the firmware must be done from Master JBOD Controller (JBOD Controller 1) if the JBOD Subsystem has redundant JBOD Controllers.**

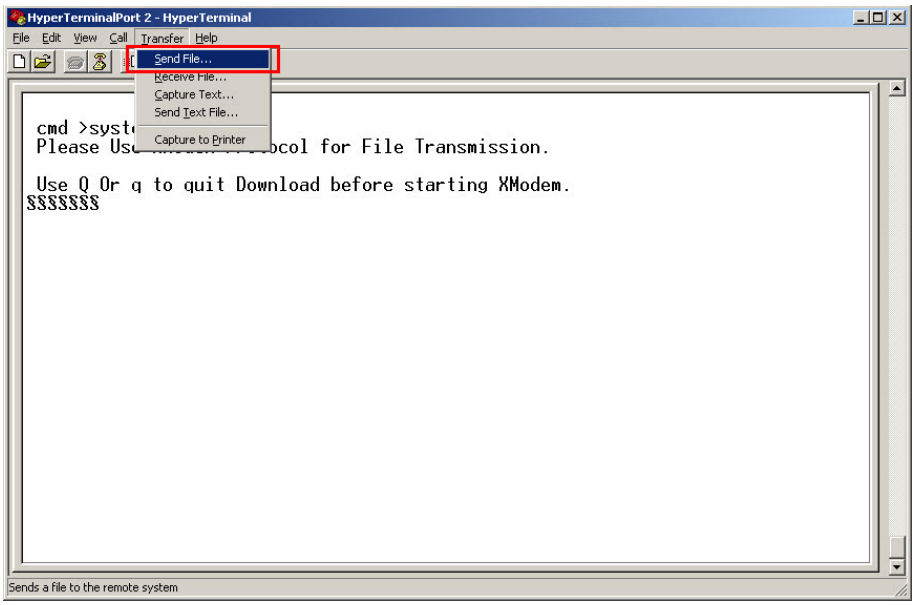
**Steps:**

1. Used RS-232 Port (RJ-11 to DB9) link ProSun SAS JBOD, in command line please type “system upgrade”, than press “Enter”.

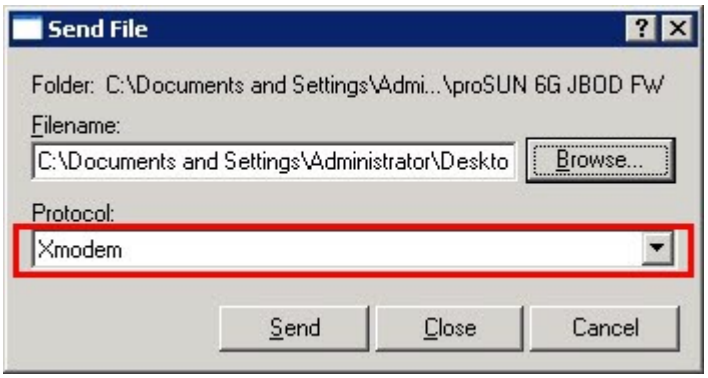


2. Select Transfer & Send File.

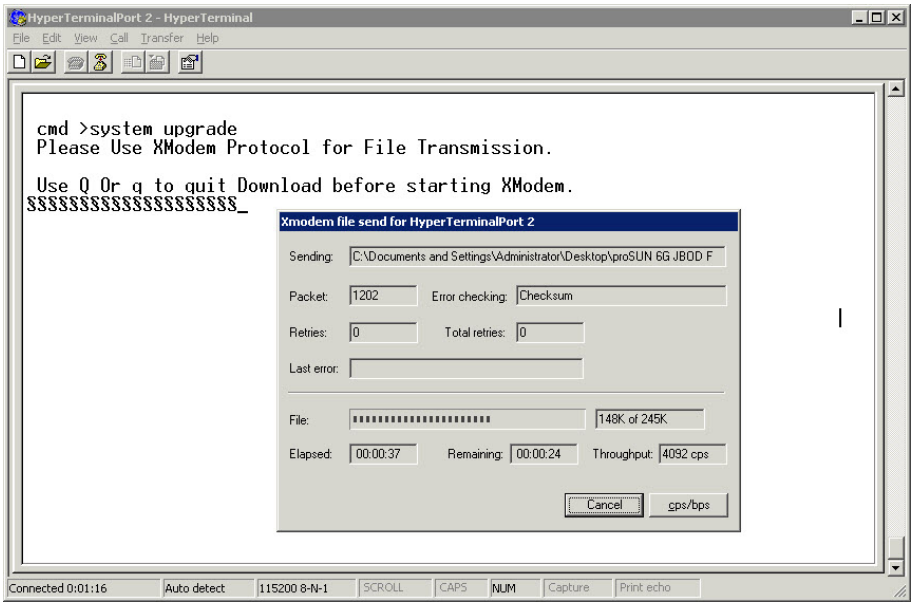
**You must finish within 25 seconds**

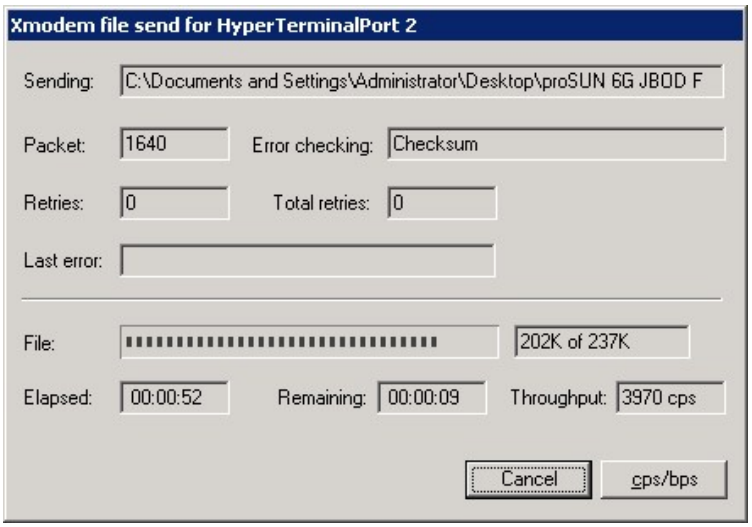

HyperTerminalPort 2 - HyperTerminal
File Edit View Call Transfer Help
Send File...
Receive File...
Capture Text...
Send Text File...
Capture to Printer
Use Q Or q to quit Download before starting XModem.
Sends a file to the remote system

3. Select your firmware file path, and select Xmodem in the communication protocol, and click transfer button.

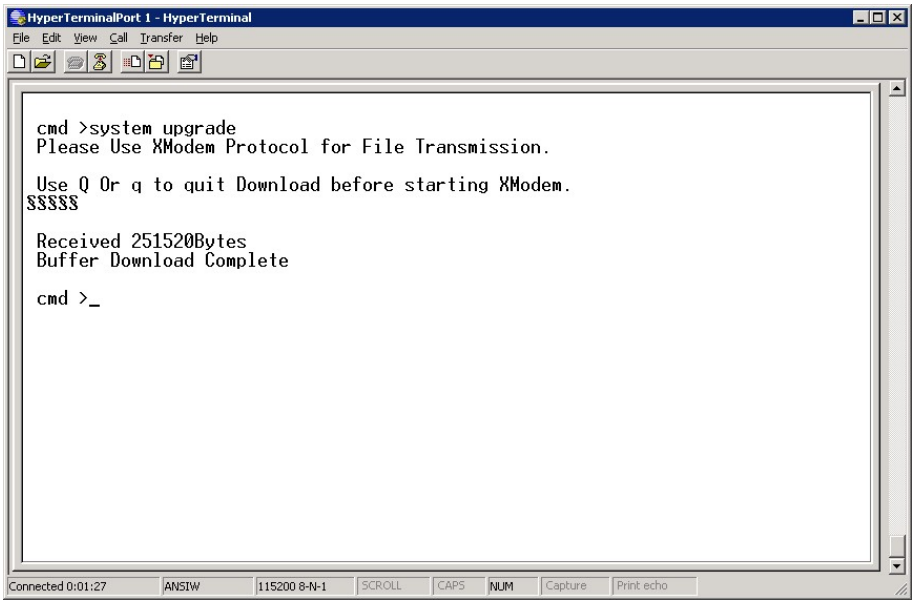


4. Wait for the transfer of file to complete.

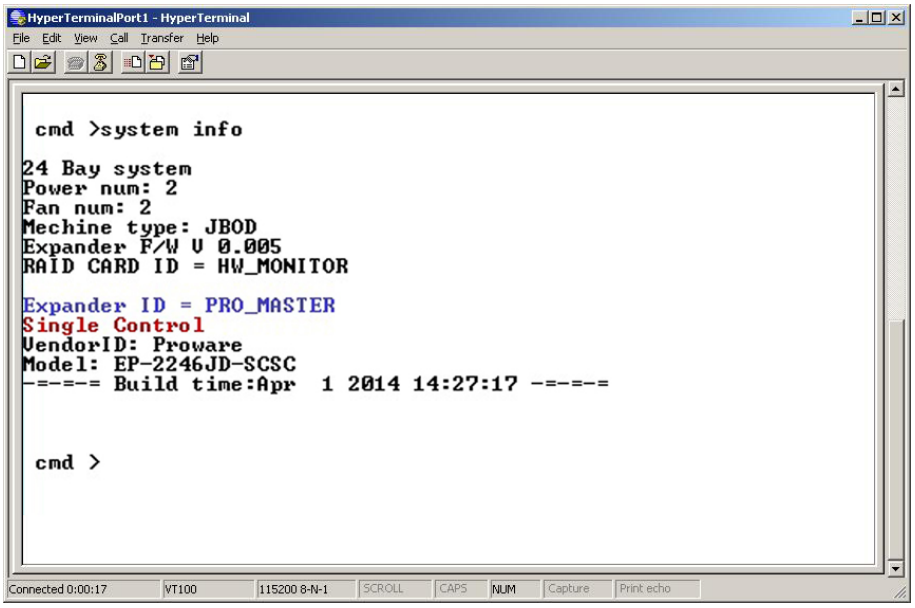

HyperTerminalPort 2 - HyperTerminal
File Edit View Call Transfer Help
cmd >system upgrade
Please Use XModem Protocol for File Transmission.
Use Q Or q to quit Download before starting XModem.
CCCCCCCCCCCCCCCCCCCCCC
Xmodem file send for HyperTerminalPort 2
Sending: C:\Documents and Settings\Administrator\Desktop\proSUN 6G JBOD F
Packet: 1202 Error checking: Checksum
Retries: 0 Total retries: 0
Last error:
File: 148K of 245K
Elapsed: 00:00:37 Remaining: 00:00:24 Throughput: 4092 cps
Cancel cps/bps
Connected 0:01:16 Auto detect 115200 8-N-1 SCROLL CAPS NUM Capture Print echo


Xmodem file send for HyperTerminalPort 2
Sending: C:\Documents and Settings\Administrator\Desktop\proSUN 6G JBOD F
Packet: 1640 Error checking: Checksum
Retries: 0 Total retries: 0
Last error:
File: 202K of 237K
Elapsed: 00:00:52 Remaining: 00:00:09 Throughput: 3970 cps
Cancel cps/bps

5. When the transfer and firmware update is complete, please power cycle the JBOD.




6. In command line, type “system info”, you can see the Expander firmware version.



## 3.2 Replacing JBOD Subsystem Components

### 3.2.1 Replacing JBOD Controller Module

When replacing a failed JBOD Controller Module, please follow these steps:

1. Loosen the thumbscrews on the sides of the JBOD Controller Module drawer.
2. Use the Controller handle to pull out the defective JBOD Controller Module drawer.
3. Insert and slide the new JBOD Controller Module in. Note that it may be necessary to remove the old/defective JBOD Controller Module from the drawer case and install the new one.

**IMPORTANT: When replacing a failed component online, it is not recommended to remove the failed component for a long period of time; proper air flow within the enclosure might fail causing high controller/disk drive temperature.**

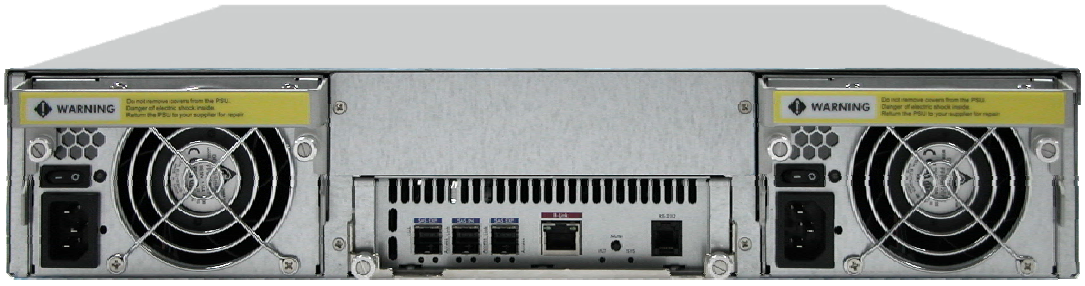
4. Tighten the thumbscrews on the sides of the JBOD Controller Module case.

### 3.2.1.1 Replacing Controller Module with Blanking Plate

When replacing a failed JBOD Controller Module with Blanking Plate, please follow these steps:

1. Loosen thumbscrews of the failed JBOD Controller Module drawer.
2. Use the Controller Module handle to remove the failed JBOD Controller Module drawer from the subsystem.
3. Insert the JBOD Controller Blanking Plate.

4. Tighten the screws of the Blanking Plate.




**When replacing a failed component online, it is not recommended to remove the failed component for a long period of time; proper air flow within the enclosure might fail causing high controller / disk drive temperature.**

### 3.2.2 Replacing Power Supply Fan Module

When replacing a failed power supply fan module (PSFM), please follow these steps:

1. Turn off the Power On/Off Switch of the failed PSFM.
2. Disconnect the power cord from the AC Inlet Plug of PSFM.
3. Loosen thumbscrews of the PSFM.
4. Use the handle to pull out the defective PSFM.
5. Before inserting the new PSFM, make sure the Power On/Off Switch is on "Off" state.
6. Insert and slide the new PSFM in until it clicks into place.

**IMPORTANT: When the subsystem is online and a Power Supply fails, and the replacement Power Supply module is not yet available, the failed Power Supply Module can be replaced with the Plate Cover. This is to maintain proper airflow within the enclosure. (Refer to next section)**

**When replacing a failed component online, it is not recommended to remove the failed component for a long period of time; proper air flow within the enclosure might fail causing high controller/disk drive temperature.**

7. Connect the power cord to the AC Inlet Plug of PSFM.
8. Tighten the thumbscrews of the PSFM.
9. Turn on the Power On/Off Switch of the PSFM.

**NOTE: After replacing the Power Supply Fan Module and turning on the Power On/Off Switch of the PSFM, the Power Supply will not power on immediately. The Fans in the PSFM will spin-up until the RPM becomes stable. When Fan RPM is already stable, the RAID controller will then power on the Power Supply. This process takes more or less 30 seconds. This safety measure helps prevent possible Power Supply overheating when the Fans cannot work.**

### 3.2.2.1 Replacing Power Supply Fan Module with Plate Cover

When replacing a failed power supply fan module (PSFM) with Plate Cover, please follow these steps:

1. Turn off the Power On/Off Switch of the failed PSFM.
2. Disconnect the power cord from the AC Inlet Plug of PSFM.
3. Loosen thumbscrews of the failed PSFM.
4. Pull out the defective PSFM.
5. Insert the PSFM Plate Cover carefully.